

**User Manual R1.2**  
**Santacary Technology Co., Ltd.**  
**XAR-O O<sub>2</sub> Gas Detector**



## INTRODUCTION

Santacary XAR-O is a precise gas detector for monitoring Oxygen (O<sub>2</sub>) in the ambient air and in the work place. It has been designed to protect the safety of workers in dangerous work places. The XAR-O will continuously display the ambient concentration of oxygen and activate its audible alarms whenever the preset set points are exceeded. It is used exclusively for monitoring and cannot be used for measuring oxygen concentrations. The detector is a personal safety device. It is users' responsibility to respond properly to the alarm.

In addition to monitoring the oxygen, the Santacary XAR-O can also measure the ambient temperature and the relative humidity.

XAR-O can be widely used in the car, touring car, garage, food/fruits/goods container, petrochemical, power plant, telecom, medicine, mine, heavy industry, army, food industry, gas industry, and other confined spaces for personal safety.

Please read this manual carefully before use. This operation manual will provide you with all the necessary information for the correct use of your XAR-O oxygen detector.

## FEATURES

- Portable O<sub>2</sub> gas detector
- O<sub>2</sub> gas detector range: 0 ~ 30.0% vol. Resolution: 0.1% vol.
- Using world top brand electrochemical oxygen sensor
- Support ambient fresh air calibration (20.9% vol.)
- Audible alarm
- Two levels of instantaneous alarm
- Trend chart display showing the past readings for O<sub>2</sub>
- With temperature and humidity measurement
- Only two buttons and easy to operate

- Four AA Alkaline Batteries

## THEORY OF OPERATION

The Santacary XAR-O O<sub>2</sub> Gas Detector uses two-electrode electrochemical technology, operating by the diffusion principle, for determining the concentration of oxygen in air samples. In diffusion mode, the atmosphere reaches the air sampling ports on beside and top of the detector. Normal air movements are enough to carry the sample to the sensor.

## UNIT DESCRIPTION

### Device


1. Liquid crystal display (LCD)
2. Power button
3. Function button
4. Battery compartment back cover
5. Air sampling ports




## OPERATION

### 1. Power Button

#### 1.1 Turn On/Turn Off Detector

1) When the detector is turned off, press Power button  to turn on the unit.

2) When the detector is turned on, press Power button  for 2 seconds to turn off the unit.

When the unit is first turned on, it performs 60 seconds countdown for detector initial warm up, then enters normal display with current O<sub>2</sub> concentration (% vol.), temperature (°C or °F), and humidity (%RH) readings displayed. If the detector is not used for a long time, the warm up time of oxygen sensor needs more than 5 minutes.

The detector starts taking measurements when power on and updates readings every 2 seconds. In the condition of operating environment change, it takes 15 seconds to respond for O<sub>2</sub>, and 30 minutes for humidity.

**Note:**

Do not hold the detector close to faces in case that exhalation affects O<sub>2</sub> levels.

**Note:**

Air Sampling Port: Always ensures that the detector vents are not blocked and open to the atmosphere.

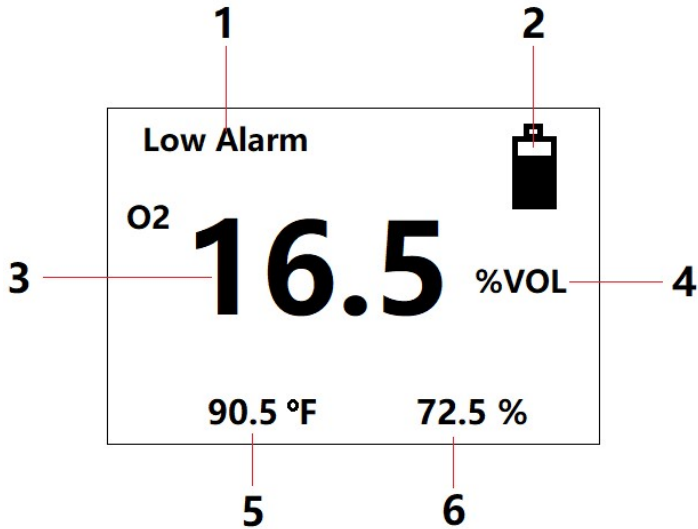
## **1.2 Fahrenheit and Celsius switching**

Press Function button **FUNC** shortly to switch two temperature units: °F and °C.

## **2. Function Button **FUNC****

Press **FUNC** shortly to switch Normal Display, Trend Chart Display and Log Display. In any Displays, press **FUNC** for 3 seconds, the detector enters into Calibration Menu display.

### **2.1 Normal Display**



1. Alarm Status (None/Low Alarm/High Alarm)
2. Battery Life Indicator
3. Oxygen concentration
4. Oxygen concentration unit in %VOL (% vol.)
5. Air Temperature
6. % Relative Humidity

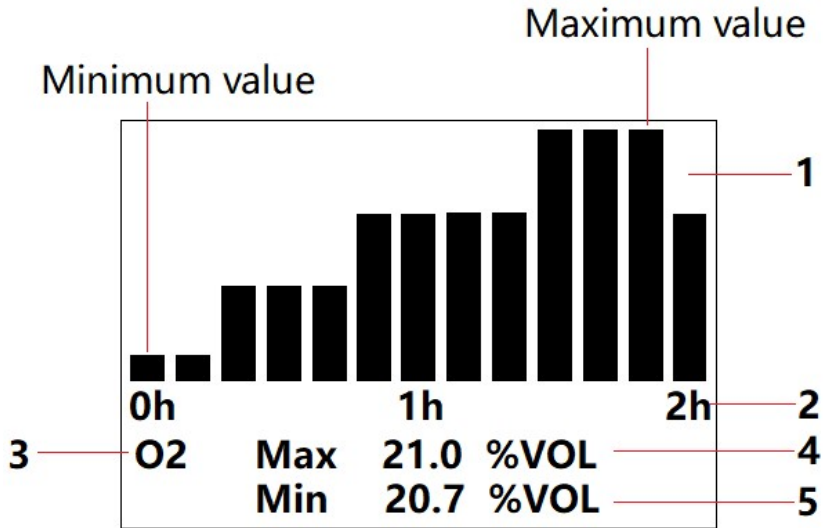
## 2.2 Trend Chart Display

XAR-O has a data log function that provides up to 2 hours history of O<sub>2</sub> concentration.

The trend chart displays the past readings for O<sub>2</sub>. The time per division (indicates the chart's time per unit division) is 10 min / div. Trend chart contains a maximum of 13 recorded data at one time. The time span is 2 hours. After the chart is full the data is FIFO (first-in, first-out). Below is the example of Trend Chart Display.

1. Vertical bar of O<sub>2</sub> (The higher the bar, the greater the value)

2. Time scale (farther to the right, longer time in the past)
3. Measurement name (O<sub>2</sub>)
4. Maximum value on the chart of O<sub>2</sub> concentration
5. Minimum value on the chart of O<sub>2</sub> concentration



At the bottom of the chart, there are two numerical indicators: Max and Min. The Max and Min values will reflect the maximum and minimum values on the chart of O<sub>2</sub> concentration.

### 2.3 Log Display

The Log Display lists the 13 recorded data in the trend chart with time samples.

1. O<sub>2</sub> unit
2. Time samples in past (m--minute, h--hour)
3. O<sub>2</sub> concentration

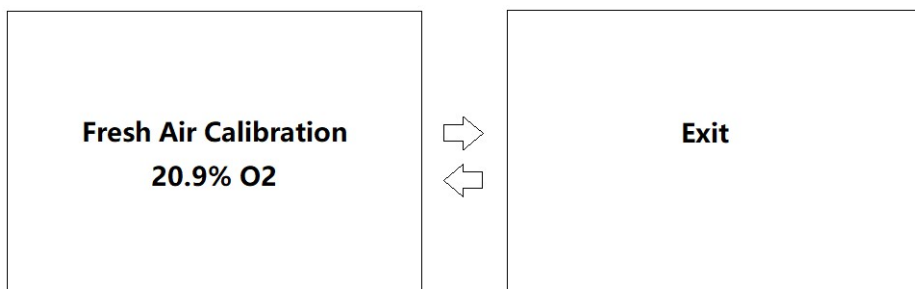
O2		%VOL	
0m	20.7	70m	20.9
10m	20.7	80m	20.9
20m	20.8	90m	21.0
30m	20.8	100m	21.0
40m	20.8	110m	21.0
50m	20.9	2h	20.9
1h	20.9		

Diagram annotations: A line labeled '1' points to the top right of the table. A bracket labeled '2' spans the O2 column. A bracket labeled '3' spans the %VOL column.

## 2.4 Ambient Air Calibration (20.9%) for O<sub>2</sub>

This detector can implement ambient air calibration (20.9%) when needed (such as annually).



By pressing the Function button **FUNC** for 3 seconds, the detector enters into Calibration Menu. In this Menu, there are two items by pressing the Function button **FUNC** shortly to loop switching: "Fresh Air Calibration 20.9% O<sub>2</sub>" and "Exit" as shown in the below figure and table.





## Calibration Menu

Menu Items	Functional Description
Fresh Air Calibration 20.9% O <sub>2</sub>	The XAR-O will perform an automatic fresh ambient air calibration (20.9% O <sub>2</sub> ). If the fresh air calibration is successful, the unit will proceed to Normal Mode
Exit	Exit the Menu and proceed to Normal Mode

Place the detector in the window ventilation, by pressing Power button  shortly in “Fresh Air Calibration 20.9% O<sub>2</sub>” item to enter the ambient air calibration (20.9%). By pressing Power button  shortly in “Exit” item to cancel calibration and return to normal status.

### Note:

- LCD backlight will turn off automatically after 2 minutes of buttons inactivity.
- When LCD backlight is off, press any button to turn on the backlight.

## ALARM

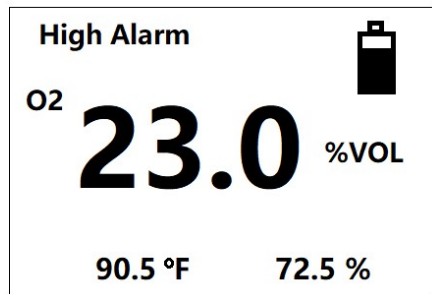
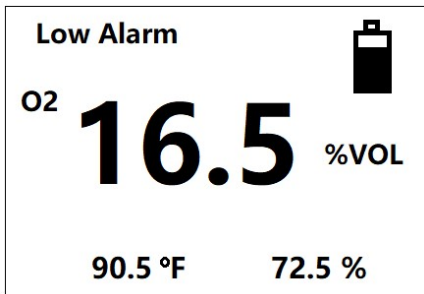
### Low Alarm and High Alarm

XAR-O has two alarm set points: Warning (O<sub>2</sub>: 23.5%, high alarm) and Danger (O<sub>2</sub>: 19.5%, low alarm). The danger alarm is sounded for oxygen deficiency and the warning alarm is sounded for oxygen enrichment. These set points are factory set and cannot be changed.

XAR-O is equipped with audio alarms to alert you when the ambient gas concentration exceeds one of the two alarm set points. When oxygen value is less than the defined low alarm set point (Danger alarm at 19.5%), the audio alarm will sound at 3 beeps/sec. When oxygen value exceeds the defined high alarm set point (Warning alarm at 23.5%), the audio alarm will sound at 2 beeps/sec.

#### Factory Alarm Set points

Gas	Low	High
O <sub>2</sub>	19.5% vol.	23.5% vol.



#### **ATTENTION!**

**If a Warning or Danger alarm is triggered while using the instrument as a detector, leave the area immediately. Remaining on site under such circumstances can cause serious damage to health or can even lead to death.**

#### **MATERIALS SUPPLIED**

- XAR-O O<sub>2</sub> Gas Detector
- Protector Bag
- English User Manual

## SPECIFICATIONS

### Oxygen Sensor Specification:

Measurement Range	0 ~ 30.0% vol. O <sub>2</sub>
Resolution	0.1% vol.
Sample Method	Diffusion
Temperature Range	-20 to 50°C (-4°F ~ 122°F)
Humidity Range	5 to 95%RH
Baseline Drift (-10-50°C)	<1% change in output @ 3 months
Response time	<15 seconds from 20.9% to 0% O <sub>2</sub>

### Temperature Specification

Temperature Range	-10.0~60.0°C (14~140°F) display
Display Resolution	0.1°C (0.1°F)
Display Options	°C/°F switchable
Accuracy	±0.5°C (±0.9°F)
Response Time	5~30 seconds (device must equilibrate with environment)

### RH Specification

Measurement Range	0.0~99.9%RH
Display Resolution	1%RH
Accuracy	±4.5%RH
Response Time	<8 seconds for 63% of step change

### General Specification

Operating	-10°C to 50°C (14°F to 122°F), 5~95% RH non-condensing
Storage	-10°C to 60°C (14°F to 140°F), <99%

	RH non-condensing
Power Supply	Four AA Alkaline Batteries
Dimensions	75x165x25 mm (2.95x6.49x0.98")
Weight	136 grams (4.8 oz.) without batteries

Out of range of operating conditions will impact the accurate of O<sub>2</sub> measurement.

## MAINTENANCE

To maintain the detector in good operating condition, perform the following basic maintenance as required.

1. Calibrate and inspect the detector at regular intervals.
2. Clean the exterior with a soft damp cloth. Do not use solvents, soaps, or polishes.
3. Do not immerse the detector in liquids.

## Troubleshooting

If a problem occurs, refer to the solutions provided in below table. If the problem persists, contact Santacary Technology Co., Ltd..

<b>Problem</b>	<b>Possible cause</b>	<b>Solution</b>
The detector can't power on	Batteries are not properly placed	Please check that the batteries are properly placed
	Damaged or defective detector	Contact Santacary Technology Co., Ltd.
The detector enters alarm immediately	Sensor needs to stabilize	If the detector is not used for long time, the warm up time of

when activated		oxygen sensor needs more than 5 minutes.
	Sensor requires calibration	Calibrate the sensor
	Hazardous environment	Leave the area immediately. Deactivate and reactivate the detector in a safe area that is free of hazardous gas.
Detector does not accurately measure O <sub>2</sub> gas.	Sensor requires calibration	Calibrate the sensor.
	Detector is colder/hotter than O <sub>2</sub> gas temperature	Allow the detector to attain ambient temperature before use
	Air vents are blocked	Make sure that the air vents are ventilated

## WARRANTY

The XAR-O is warranted to be free from defects in material and workmanship for a period of one year from the date of purchase. This warranty covers normal operation and does not cover misuse, abuse, alteration, neglect, improper maintenance.

Proof of purchase is required for warranty. Warranty is void if the detector has been opened.

## CONTACT US

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